The Biomedical Research Bottleneck

The revolution in molecular biology portends a new era in the treatment and prevention of human diseases. New laboratory findings promise new ways to diagnose, treat, and ultimately cure cancer, heart disease, diabetes, and innumerable other diseases. To translate these discoveries into new treatments, clinical investigators have become more important than ever before. Yet in the United States their ranks are shrinking, creating a serious bottleneck in the pathway to new types of treatment. To encourage the best and brightest physicians to choose careers in clinical research, the U.S. scientific enterprise must address a fundamental problem: the high cost of medical education.

Clinical research is most often carried out by multidisciplinary teams of investigators led by physician-scientists who can bridge the gap between basic research and the health of the patient or the public. These physician-scientists are trained to move between two cultures: the laboratory and the bedside. Over the past 15 years, while the number of other biomedical researchers has been expanding, the number of physicians reporting research as their primary career has dropped. According to the American Medical Association, the percentage of U.S. physicians in this category declined from 4.2 to 1.8% between 1984 and 1999, reflecting a decrease from 23,214 to 14,357 in the number of physician-scientists, with only a subset conducting patient-oriented research.

A number of factors have contributed to this decline, including the length of time it takes to prepare for a clinical research career, the complexity of mastering both basic and clinical sciences, intense competition for research grants, and, in the United States, the high cost of medical education. Managed health care and steep reductions in medical reimbursements by the government (Medicare) have also limited the time and resources available for clinical research.

In order to prevent physician-scientists from becoming an endangered species, a number of grant-making institutions, including all of ours, have created research grant programs that support young physicians beginning their careers in clinical research. The major funder of biomedical research in the United States, the National Institutes of Health (NIH), has also responded to the U.S. decline in physician-investigators by targeting new award programs to these individuals. These programs are very important, but they must address one of the major reasons for the relative decline in young physician-scientists. Young physicians simply cannot afford to commit to careers in clinical research, in which the pay is significantly lower than that of practicing physicians, because of the magnitude of their debt. A survey of graduating U.S. medical students conducted in 2000 by the Association of American Medical Colleges revealed that 81% of medical school graduates have educational debt and that the average debt was almost $95,000. With this heavy debt burden, many medical students are compelled to go directly into clinical practice and devote all of their time to billable services.

Until recently, the NIH's authority to provide support for loan repayment for physician-scientists has been extremely limited. Some institutions have incorporated loan repayment or tuition support into their grant programs for young physician-scientists, but their efforts alone are not enough. We applaud the U.S. Congress for recently expanding NIH's loan repayment authority and encourage the NIH leadership to move quickly to include loan repayment in its physician-scientist award programs.

The NIH budget has grown by 48% since 1998 and currently stands at $20.3 billion. Investing in the basic biomedical enterprise without adequately sustaining the clinical research necessary to translate these findings into new therapies and cures would be shortsighted. At a recent meeting of grant-making organizations and NIH leadership, the NIH expressed its commitment to significantly expand its extramural loan repayment programs. We encourage the NIH to move rapidly to articulate and implement this plan, and given the dramatic growth in the NIH budget, we urge the use of substantial funds for this effort. Seeding the next generation of physician-scientists will contribute greatly to the rapid translation of scientific breakthroughs into therapeutic breakthroughs.

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